STATEMENT OF WORK

Technical Support for Groundwater Investigations at the West Lake Landfill Site.

1. BACKGROUND INFORMATION

The West Lake Landfill Site is on a parcel of approximately 200 acres located in the northwestern portion of the St. Louis metropolitan area. It is situated approximately one mile north of the intersection of Interstate 70 and Interstate 270 within the limits of the city of Bridgeton in northwestern St. Louis County. The Missouri River lies about 1.5 miles to the north and west of the Site.

The Site consists of the Bridgeton Sanitary Landfill (Former Active Sanitary Landfill) and several inactive areas with sanitary and demolition fill that have been closed. Land use at the site and the surrounding areas in Earth City is industrial.

Other facilities which are not subject to this response action are located on the 200-acre parcel including concrete and asphalt batch plants, a solid waste transfer station, and an automobile repair shop.

The Site was used agriculturally until a limestone quarrying and crushing operation began in 1939. The quarrying operation continued until 1988 and resulted in two quarry pits. Beginning in the early 1950s, portions of the quarried areas and adjacent areas were used for landfilling municipal solid waste (MSW), industrial solid wastes, and construction/demolition debris. These operations were not subject to state permitting because they occurred prior to the formation of the Missouri Department of Natural Resources (MDNR) in 1974. Two landfill areas were radiologically contaminated in 1973 when they received soil mixed with leached barium sulfate residues.

The barium sulfate residues, containing traces of uranium, thorium, and their long-lived daughter products, were some of the uranium ore processing residues initially stored by the Atomic Energy Commission (AEC) on a 21.7-acre tract of land in a then undeveloped area of north St. Louis County, now known as the St. Louis Airport Site (SLAPS), which is part of the St. Louis Formerly Utilized Sites Remedial Action Program managed by the U.S. Army Corps of Engineers.

Reportedly, 8,700 tons of leached barium sulfate residues were mixed with approximately 39,000 tons of soil and then transported to the Site. According to the landfill operator, the soil was used as cover for municipal refuse in routine landfill operations.

The geology of the landfill area consists of Paleozoic-age sedimentary rocks overlying Pre-Cambrian-age igneous and metamorphic rocks. The Paleozoic bedrock is overlain by unconsolidated alluvial and loess deposits of recent (Holocene) age. Alluvial deposits of varying thickness are present beneath Areas 1 and 2. The landfill debris varies in

thickness from 5 to 56 feet in Areas 1 and 2, with an average thickness of approximately 30 feet in Area 2. The underlying alluvium increases in thickness from east to west beneath Area 1. The alluvial thickness beneath the southeastern portion of Area 1 is less than 5 feet (bottom elevation of 420 ft/amsl) while the thickness along the northwestern edge of Area 1 is approximately 80 feet (bottom elevation of 370 ft/amsl). The thickness of the alluvial deposits beneath Area 2 is fairly uniform at approximately 100 feet (bottom elevations of 335 ft/amsl).

During the RI investigations, groundwater was generally encountered in the underlying alluvium near or immediately below the base of the landfill debris. Isolated bodies of perched water were encountered in 2 of the 24 soil borings drilled in Areas 1 and 6 of the 40 borings drilled in Area 2 as part of the RI field investigations. The perched water generally occurs in small isolated units at depths varying from 5 to 30 feet below ground surface. Monthly groundwater levels measured in various landfill wells indicate that only a very small amount of relief (less than a foot) exists in the natural alluvial water table surface. The regional direction of groundwater flow is northerly within the Missouri River alluvial valley, parallel or sub-parallel to the river alignment. However, the leachate collection system for the Former Active Sanitary Landfill creates a localized cone of depression that extends across the eastern half of the Site and includes the water table underlying Area 1.

Vertical hydraulic gradients were calculated using piezometer clusters. The vertical hydraulic gradients for the shallow alluvium to intermediate or deep alluvium and for deep alluvium to shallow bedrock are very small and vary from slightly downward to slightly upward.

II. OBJECTIVE AND SCOPE

The EPA is requesting assistance from the USGS to conduct technical support of the supplemental PRP-lead investigations including assisting in scoping investigations, reviewing data, and determining background levels of uranium, thorium and radium in groundwater at and surrounding the West Lake Landfill. The technical support may consist of performance of specific tasks which USEPA contractors have neither the expertise or cannot provide at reasonable cost to EPA.

This work assignment includes technical review of documents to provide expert advice on topics such as hydrogeology, geochemistry, water quality, solute transport, or groundwater modeling of which USGS has known expertise.

III. WORK ASSIGNMENT TASKS

The USGS shall furnish personnel and services required to provide assistance in reviewing historical data that has been collected by PRPs. This review will assist the EPA in determining data gaps essential to determining background radionuclide concentrations in groundwater at and around the site, identifying the appropriate

methodologies for addressing data gaps, reviewing work plans generated for performance of the methodologies, and evaluating the data resulting from field activities. Additionally, personnel shall be provided to participate and support the EPA in updating the community of efforts at public events. Finally, USGS may provide radiological analytical support for split samples for uranium, thorium and radium isotopes that EPA may collect during future groundwater sampling events, through USGS' contract laboratories, if it can be demonstrated that the analytical capabilities of the contract laboratory (ies) are equivalent to those being used by the responsible parties for their radiological analyses.

Tasks

1. Project Planning and Support
2. Community Relations
3. Field Investigations
4. Sample Analysis
5. Analytical Support and Data Validation
6. Data Evaluation
7. Assessment of Risks
8. Treatability Study/Pilot Testing
9. Remedial Investigation Report
10. Remedial Alternatives Screening
11. Remedial Alternatives Evaluation
12. FS Report and RI/FS Report
13. Post RA Support
14. Negotiation Support
15. Administrative Record
16. Close Out

TASK 1 PROJECT PLANNING AND SUPPORT

This task includes work efforts related to project initiation, management, and support. Activities required under this task include the following, as applicable:

1.1 The USGS shall participate in a scoping meeting with EPA to discuss the work assignment.

1.2 The USGS shall prepare a work plan of support activities.

1.3 Based on EPA's review of the work plan, the USGS may be called upon to participate in negotiations with EPA on the work plan and to revise the work plan as a result of these negotiations or comments made regarding the work plan.

1.4 The USGS shall prepare, if needed, a Field Sampling Plan (FSP) that describes the number, type, and locations of samples, the type of analyses required, and the method that will be used to collect them.

1.5 The USGS shall prepare, if needed, a site-specific Quality Assurance Project Plan (QAPP) in accordance with EPA QA/R-5. The plan shall describe the data quality objectives and the measures necessary to achieve them.

1.6 The USGS shall perform site-specific project management including:

- Establishment and maintenance of necessary work assignment files
- Perform contract administration functions associated with this work assignment
- Provide quarterly reporting and invoices
- Monitor costs and performance
- Coordinate staffing and other support activities to perform the work assignment tasks in accordance with the Statement of Work (SOW) including Team subcontractors and other subcontractors
- Attend necessary work assignment meetings

1.7 The USGS shall accommodate any external audit or review mechanism that EPA may require.

TASK 2 COMMUNITY RELATIONS

USGS staff will attend and participate in technical meetings and community meetings, as requested by EPA, to help explain USGS interpretations of site data.

TASK 3 FIELD ACTIVITIES

NA

TASK 4 SAMPLE ANALYSES

NA

TASK 5 ANALYTICAL SUPPORT AND DATA VALIDATION

USGS may provide radiological analytical support for groundwater split samples for uranium, thorium and radium isotopes that EPA may collect during future groundwater sampling events, through USGS' contract laboratories, if it can be demonstrated that the analytical capabilities of the contract laboratory (ies) are equivalent to those being used by the responsible parties for their radiological analyses. Previously, the PRP used Eberline Services' Oak Ridge, TN laboratory for their radiological analyses. EPA's split samples cannot be analyzed at the same lab that is analyzing the PRPs' samples. EPA may collect up to ten (10) split samples during each quarterly groundwater sampling event performed by the responsible parties in 2013. Analytical methods include Ra-226 by EPA method 903.0MOD (alpha spec), Ra-228 by 904.0MOD, Th by DOE EML TH-01, and U by DOE EML U-02. USGS will not perform fieldwork or data validation for the groundwater split sampling or analyses.

TASK 6 DATA EVALUATION

This task includes work efforts related to the evaluation of analytical and field data. The data is to be in a form compatible with EPA's computer systems so that it can be entered into a Region 7 database. Activities required under this task include the following:

6.1 The USGS shall provide technical expertise pertaining to USGS collected and interpreted data (if any) and reviews of hydrologic and geochemical data collected and published by other agencies or companies. Areas of evaluation are expected to include hydrogeology, geochemistry (including background levels), water quality, solute transport, and/or groundwater modeling.

6.2 The USGS shall provide their evaluation of the data to EPA as a USGS letter-type administrative report or letter.

TASK 7 ASSESSMENT OF RISKS

NA

TASK 8 TREATABILITY STUDY/PILOT TESTING

NA

TASK 9 REMEDIAL INVESTIGATION REPORT

NA

TASK 10 REMEDIAL ALTERNATIVE SCREENING

NA

TASK 11 REMEDIAL ALTERNATIVE EVALUATIONS

NA

TAKS 12 FS REPORT AND RI/FS REPORT

The USGS shall provide technical assistance in the review and evaluation of the PRP's Supplemental Feasibility Study reports and a ROD Amendment, if needed.

TASK 13 POST REMEDIAL ACTION SUPPORT

NA

TASK 14 NEGOTIATION SUPPORT

NA

TASK 15 ADMINISTRATIVE RECORDS

NA

TASK 16 WORK ASSIGNMENT CLOSE OUT

This task includes efforts related to work assignment close out. Activities required under this task include the following:

16.1 Upon notification by EPA, the USGS shall begin all internal procedures necessary to close out the work assignment including any file duplication, distribution, storage, or archiving per the contract requirements.

16.2 The USGS shall return documents identified to EPA or other document repositories as directed.

IV. WORK ASSIGNMENT PERIOD OF PERFORMANCE

March 22, 2013 to December 30, 2015

V. SCHEDULE OF DELIVERABLES/MILESTONES

1.6	Quarterly Reports/Invoices	Throughout period
5	Analytical Data Packages	As requested (up to 3 events)
6.1	Data Evaluation	Throughout period
12	Data Evaluation	Throughout period

VI. PEFORMANCE CRITERIA

The USGS's deliverables will be inspected by the government for acceptability. Unacceptable deliverables will be returned to the USGS with comments and directions for necessary corrections or rework which may be applicable.

VII. ACCEPTANCE CRITERIA

The following are the acceptance criteria for the deliverables under this work assignment.

TASK	DELIVERABLE/SERVICE	CRITERIA
1.6	Quarterly Reports/Invoices	Narrative of specific task

		and subtask activities sufficient enough for work assignment manager to evaluate the work assignment progress.
5	Analytical Data Package	In accordance with pre-existing EPA QAPP.
6.1	Data Evaluation	Timely, complete, and accurate review and evaluation of data results and conclusions.
12	Data Evaluation	Timely, complete, and accurate review and evaluation of data results and conclusions.

VIII. EPA CONTACTS

Project Manager	Dan Gravatt	913-551-7324
Project Officer	Marie Rabenau	913-551-7968